UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/509,290	06/20/2005	Jas Pal Singh Badyal	42965-P041US	2188

43167 7590 08/20/2009
WINSTEAD P.C.
PO BOX 50784
DALLAS, TX 75201

EXAMINER	
PADGETT, MARIANNE L	

ART UNIT	PAPER NUMBER
1792	

MAIL DATE	DELIVERY MODE
08/20/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/509,290	BADYAL ET AL.
	Examiner	Art Unit
	MARIANNE L. PADGETT	1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 15 April 2009.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-23 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-23 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. Applicants' submissions of 4/15/2009 have amended the claims to correct the improper multiple dependencies, such that all the claims may now be examined. With respect to clarity of the previously examined claims, especially independent claim 1, while some of the problems have been corrected, others previously noted remain & new clarity issues have been introduced, as will be discussed below.

The submitted substitute specification & markup copy thereof, which while inserting a new paragraph in the markup copy/substitute specification, and renumbering subsequent paragraphs, does not strike through when deleting old paragraph numbers (or even indicate that they are deleted), and ends with the same paragraph number of [0101], but that appears to be because the original specification lacked the numbering [0100], thus other than this informality, the substitute specification & markup copy appear to be in correct format & corrects problems as were previously indicated by applicants & discussed in section 1 of the action mailed 10/1/2008, hence will be considered acceptable.

The **102(b)** over **Seki et al.** (JP 03-14677) is considered removed, because while the English abstract of Seki et al. disclose a sequence of plasma steps treating a fibrous substrate material with a low temperature gas plasma, where the gas may be fluorine containing C_2F_4 or C_2F_6 (i.e. a fluoride) or ethylene or a silane gas, in order to deposit a polymer film on the fibrous material (i.e. polymerized on to the polyester fiber substrate), which is thereafter treated with a non-polymerizable gas (e.g. Ar, He, air, water vapor etc.) to crosslink the plasma deposited film, there is no mention of the initial polyester fiber being cross-linked on the surface or within the fiber or to the polymer film being deposited thereon, hence Seki et al. can no longer be considered a 102. The examiner notes while it is perfectly *possible* for the polyester fiber to be being cross-linked to the polymer film during its deposition, the English abstract lacks sufficient information to determine whether or not such a cross-linking reaction may or may not be occurring during the initial plasma deposition treatment.

2. **Claims 1-23** are rejected under 35 U.S.C. **112, second** paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The preamble of independent **claim 1** has been amended to require "applying a conditioning effect to a material substrate thereby **improving** the absorbency of said substrate" (emphasis added), however "improving" is a relative term that lacks clear metes and bounds, since what one person considers an improvement, another may find undesirable, i.e. one person may consider increasing the absorbency to constitute improving it, while another may consider decreasing the absorbency to be an improvement, thus it is unclear what effect applicants are trying to produce on their generic material substrate of unstated composition. Also, absorbency with respect to what has not been specified, i.e. to a subsequent coating, to water, to organic solvent, etc.... Therefore, in the claims has written it is unclear what effect the conditioning steps required to be performed on the substrate are actually being required to produce, or alternatively, any change in the absorbency, no matter how incremental, might be considered an improvement to someone, thus this amendment could alternatively be considered incredibly broad so as to encompass any change whatsoever. Note that it is considered that introducing "absorbency" with an article indicating antecedent basis is considered to be acceptable, since all materials will inherently have an absorbency, whether it is zero absorbency or greater with respect to any substance, which may or may not be absorbed. Also, while the preamble requires "improving the absorbency", the body of the claim may be considered **not commensurate in scope** as it does not positively require the claimed crosslinking & the plasma applied thereto to cause any "improving" of the absorbency of the substrate with respect to anything.

On page 6 of applicants' 4/15/09 response in the Remarks, applicants have argued that one of ordinary skill in the art can determine the scope of the limitation "the exterior and internal surfaces of the substrate", citing paragraphs [0009], [0019] & [0100], however these paragraphs do not define these

terms to have any particular meaning, let alone provide a meaning therefore to the class of all possible substrate materials, which is what is claimed. Paragraph [0009] merely uses the phrase, while the other two citations discuss exterior &/or internal surfaces with respect to porous substrates, which have **not** been claimed, thus provide no necessary meaning in the present claims, **as written**. Therefore, this claim terminology continues to provide uncertain scope & meaning of the claims. Paraphrased, while any substrate may be considered to have an exterior surface(s), what might be "internal surfaces" remains unclear, as the language could imply, but **does not necessitate** that the substrate be either a hollow substrate or a porous substrate, or the like, such that it is uncertain if the language is intended to require the substrate to be either hollow or porous, or if the "internal surface" is intended to have some meaning applicable to all possible substrate configurations as claimed.

It is further noted that as amended the act of "crosslinking of the material..." is now required to occur (was not previously positively required), however given that the "a material substrate" has no necessary composition, but is inclusive of all possible materials (i.e. metal, metal oxides, polymers, wood, etc.), is unclear how one performs crosslinking on all the class possible claimed materials (e.g. how is metal crosslinked?), or if applicants are intending to limit their materials to claim only those materials which are crosslinkable, but they have not **positively** claimed such a limitation. Also note that "the material" introduced in claim 1, lines 5-6, lacks proper antecedent basis, thus is objected to, since this noun was not previously introduced, although as it was used as an adjective describing "substrate", one of ordinary skill in the art could infer the intent of the phrase, although the examiner is uncertain whether this phrasing is intended to imply that the substrate is made out of only a single material & can't be a composite of more than one material, etc.

Exactly how many of each step is required by the amended claim language of **claim 1**, i.e. at least two treatment steps of: (i)...; and (ii)...", is uncertain & **ambiguous**, as the "at least two..." phrasing could mean that the minimum requirement is 1 crosslinking step & 1 plasma treatment thereof, which is 2

treatments; or the "at least two..." could be intended to apply to each type of step, thus to mean that the minimum is 2 crosslinking treatments +2 plasma treatments. For purposes of examination, the simplest possible requirement will be considered as the minimum required to read on the claims as written, however the scope of the claims needs to be clearly determinable.

With respect **claim 3**, while applicants have corrected some problems therein via amendment, the problem with respect to "inert... gas" remains & does not appear to have been discussed in their Remarks. To reiterate, it is unclear what the difference between "noble gas" & "inert gas" is intended to be, as these are synonyms for the last col. of the periodic table & nothing in applicants' specification provided any differentiating definition, hence for purposes of examination they will be treated as identical. Note, if applicants mean -- nonreactive -- when using the term "inert gas", this would be a relative term lacking clear metes and bounds, unless what the gas is not reactive with, is defined. It is also noted that calling a noble or inert gas a precursor gas does not make much sense, since it is unclear **for what** a gas, which basically is not reactive, is a precursor. A precursor implies reaction, while inert or noble gas implies no reaction, however it is old and well-known for noble gases such as argon to be employed for plasma treatments to cause physical changes (i.e. plasma modifications of surfaces), however in such plasma processing the noble gas is not generally called "a precursor", thus applicants' terminology was & remains confusing.

Also in **claim 3**, note that while technically "the plasma" lacks proper antecedent basis, as it was used as an adjective in the independent claim, not as a noun, one of ordinary skill in the art would reasonably have been expected to understand the relationship, hence the lack of the correct article for claim 3 is only objected to. Also see dependent **claim 8**, with its dependent **claims 9-11** with similar issues (the plasma & the plasma power), or **claim 19** (the plasma) and note that other inconsistent use of terminology associated with plasma in other claims creates problems that are more than just objections,

hence applicants should seriously consider providing clear & correct antecedent basis, plus consistent terminology throughout their claims.

With respect to **claim 4** "the coating material" has absolutely **no antecedent basis**, since neither the independent claim, at nor claim 3, has reference to or requires any coating material, let alone requires any "coating" to be applied. While the independent claim has the possibility of creating a coating in the option (not positively required) of "plasma deposition", it has not been positively claimed, at nor does it employ language that is consistent with, thus having any necessary relationship to, "a coating material". Similarly, neither "the first step", nor "the second step" have any antecedent basis in the preceding claims due to inconsistent terminology. Furthermore, even if "the first step" is intended to be step (i), it is inconsistent with the independent claim, as the step therein most closely having the meaning of "the first step" is not a plasma treatment (although does not exclude plasma treatment) & has nothing to do with a coating or a coating material, but is solely directed to the substrate's material, thus this claim & its dependent claims 5-6, have **no clear relationship** or make **no sense** with respect to the requirements of the preceding claims, particularly independent claim 1, hence **cannot be properly or meaningfully** examined with respect to the prior art in relationship to independent claim 1.

Also note with respect **claim 4**, that "the plasma treatment" while implying relationship to "the **plasma**" of claim 3 & "treatment **steps** of... (ii) plasma **modification** or plasma **deposition**..." of independent claim 1, does not use language consistent with any of the previously introduced terms, as the noun "treatment" employed in this dependent claim, is different than those of the preceding claims, thus further contributing to the lack of a clear relationship for dependent claim 4 with the claims from which it depends.

Dependent **claim 5** continues the trend of inconsistent nomenclature in the requirement "the precursor gas or **liquid** used in the plasma treatment **step** are..." (emphasis added), since first no liquid has been previously required, only precursor gas, and second "the plasma treatment step" mixes terms

from preceding claims, such that it is unclear to which preceding limitations references are intended or necessarily been made. Also in claim 5, "oxygen or nitrogen containing chemical compounds" is ambiguous, as it is uncertain whether "containing chemical compounds" modifies both oxygen & nitrogen, or only modifies nitrogen, where "oxygen" would thus mean oxygen gas, as either option would make sense as written or scientifically.

Dependent **claim 6** requiring "wherein an oxidation method is used in the form of ozonolysis" fails to say **when** the claimed "oxidation method..." is being used, nor provide any necessary relationship to limitations of claims 4, 3 or 1 from which it depends. While one may supply various guesses to possible intent, claims are not supposed to require guessing. To compound this problem, the term "ozonolysis" has several possible meanings, as set forth by Hawley's Condensed Chemical Dictionary, i.e. oxidation of an organic material by means of ozone or use of ozone as a tool in analytical chemistry to locate double bonds in organic compounds via attachment to the double bond to form an ozonide (pages 864-865), thus it is also both unclear which of these processes are intended to be performed & if the use of this term is intended to imply the presence of an organic material, which has not been positively claimed.

With respect **claim 7**, it has been amended to clarify the "step" language, however it's dependence has been changed claim 3, which requires "a precursor gas is used in the generation of the plasma", but while claim 7 has one alternative that is consistent with dependent claim 3, it also claims "or liquid", thus contradicting requirement of claim 3 from which claim 7 now depends & making the relationship of "the plasma treatment in step (ii)" to preceding limitations unclear, especially "the plasma" of claim 3 that appears to refer to step (ii), unclear.

In **claim 8**, "the plasma" lacks proper antecedent basis as noted above & would appear to be referring to "plasma modification or plasma deposition" in step (ii), if one considers the independent claim language to grant antecedents, hence while "the plasma power" of dependent **claims 9-11**, would

appear to refer to "the plasma" inferred to be in step (ii), none of these claims use "step" terminology consistent with the independent claims, employing "the first step" &/or "the second step", which is inconsistent therewith, both due to word choice & because even if one associates "first" with (i), that step is not claimed to be employing plasma, such that these claims then make no sense with respect to the limitations of the independent claim, causing complete confusion as to what sequence of steps applicant is actually intending to claim. Therefore, there is no clear or meaningful way to necessarily apply these limitations to the process of the independent claim, for the claims as presently written.

Claim 12 has problems analogous to those discussed with respect to claims 5 or 7 with respect to the alternative claim of using "liquid" when precursor gas was previously required, & analogous to claims 4 & 9-11 concerning the use of terminology "the first and second steps" inconsistent with the independent claim. Furthermore, the claim of "the precursor gas or liquid... is pulsed" lacks sufficient context to be meaningful, i.e. in what way is a pulsed, is the introduction pulsed & if so where or to what effect, etc., or is some parameter applied to the gas or liquid in a pulsed manner so that it may be described as "pulsed", etc.?

Some comments with respect to **scope** in **claim 13**, it is noted that the requirement that "the substrate is defined as any article capable of supporting a coating applied thereto", is not considered to eliminate anything that might be considered to be a material substrate of claim 1, which could have either crosslinking performed on any surface, or plasma modification or plasma deposition applied to it, hence it is unclear if this claim could be said to provide any actual further limitation to the independent claim, or in other words in order for something to be called a substrate, even if it's a nanoparticle, it would be considered an article on which some form of coating could be applied, i.e. is capable of supporting a coating, thus it would appear the claim 13 is merely stating an inherent definition of substrate, such that the examiner is unclear of what further limitation this claim is intended to require.

With respect to **claim 14**, line 2 introduces "an exterior surface" as a new limitation, thus indicating that it is or may be different than "the exterior... surfaces of the substrate" previously introduced in the independent claim, such that it is unclear for the claims **as written**, if the exterior surface that is treated in the independent claim, it is intended to be the exterior surface described in claim 14, or to be somehow differentiated therefrom. However, even if one assumes that the independent claims "the exterior and internal surfaces" necessarily refer to "an exterior surface" and surfaces of "pores extending from the exterior surface into the bulk matrix", respectively, the claim of "said bulk matrix exterior and interstitial surfaces" lacks antecedent basis for the structure as described in the preceding lines & independent claim, as a bulk matrix has been described as something separate & different from the exterior surface, which was not described as having an exterior, nor are "interstitial surfaces" related to any previously claimed structures (& it is unclear whether "said" is intended to apply to them or not). While one may guess that the "interstitial surfaces", "internal surfaces" & "pores" may all have or be related surfaces, the claims neither necessitate nor require any relationship, hence lacking clarification of claim language, must be considered vague and indefinite.

It is also noted with respect **claim 14**, the last phrase "at least in part, polymeric or oligomeric" does not clearly designate to what it refers, although is most closely associated with "said bulk matrix exterior and interstitial surfaces", thus not improving the clarity for reasons noted immediately above. However, assuming that applicant's intent is that at least some of an exterior or an interior surface (e.g. pore surface) is polymeric or oligomeric, this would appear to contradict the inference of "the material" of claim 1, lines 5-6, which might be intending to refer to "a material substrate", which by introducing the noun "material" with the article "the" appeared to indicate only one material (see above discussion), thus providing possible contradictory meaning with respect to the independent claim with the phrase "at least in part". More careful use of consistent claim language & appropriate article usage to show clear antecedent basis is recommended to avoid problems such as this.

Claim 16, which depends through claim 15 on claim 14, requires "the bulk matrix has a void volume ranging from 0.01 % to 99 %", however as described in these claims, it is unclear to the examiner whether the pores are intended to be considered as part of "the bulk matrix", thus whether the claimed void volume is in addition to the pores, or encompasses them, especially considering that the examiner would never consider something that has a 0.01 % void volume to be porous, as such a void volume approaches theoretical density, while on the other hand a bulk matrix that had 99% void volume has essentially no bulk, and even less if the pores are considered additional to the void volume of the matrix, thus in either case this range of void volumes does not appear to be consistent with logical meaning of terminology of claim 14. Given claim 16, dependent on the substrate that is said to be "a porous article" is including the possibility **as claimed** that porous may be considered to have a void volume of 0.01% (.0001 unit volumes/100 unit volumes), which is what most people would consider quite dense, it appears that essentially all articles in existence (except perhaps articles close at theoretical density, or neutron stars or the like) should be considered porous for the purposes of these claims. Also, since as claimed, 0.01 % void volume is considered a further limitation to narrow the scope of porous (due to its positioning as a dependent claim of the previously claimed porous article) what even more dense materials are considered porous for the purposes of these claims is not clear. The examiner also notes that paragraph [0020] in substitutes specification has an exemplary broadest void volume range corresponding to dependent claim 16's range, thus also does not exclude denser materials being called a porous" for the purpose of this specification. While the examiner found the terms "porous" & "non-porous" employed in the specification describing substrates or films (e.g. [0053], a [0056], [0058-59], [0063], [0070], etc.), she found no indication or definition of how dense a substrate had to be in order to be considered nonporous, or of just how dense (how much <0.01 % void volume) a substrate could be and still be considered "porous" with respect to the present specification.

With respect to **claim 18**, step (ii) relates to two options of plasma modification or plasma deposition, neither of which has been positively chosen, where controlling this step to a limited depth into the material below the external surface has no meaning for plasma deposition, which as claimed is onto the surface, while "plasma modification" encompasses plasma deposition & any other process that may be performed via the plasma that somehow changes the surface &/or the bulk of the substrate material in any fashion, thus may or may not provide for effecting to a limited depth. Therefore, as presently written aspects of claim 18 must be considered optional, since for independent claim 1 reading on a plasma deposition method there is no depth of effect to be controlled, hence it is considered unclear whether or not the limitation of this claim is intended to be positively required or not.

With respect **claim 19**, it requires "the plasma", which as discussed above would appear to only refer to the options of step (ii) as being "used in either or both steps (i) or (ii)", thus is inconsistent with the preceding requirements of the independent claim, such that it is unclear whether or not "the plasma" should be considered to refer to "plasma modification or plasma deposition", or if it should be considered to lack proper antecedent basis. Note that plasma application can be selected to apply to the location of the entire substrate surface, etc., thus be localized to what ever amount of the surface chosen or whatever depth chosen, or the like.

Claims 20, 21 & 22 all employ the relative term "superabsorbent", which lacks clear metes and bounds in the claims, which do not define what range of absorbency is encompassed by "superabsorbent". It is noted that while [0004] state that "These water absorbing resins are often termed 'super absorbent polymers' or SAPS, and typically comprise crosslink hydrophilic polymers", this is not a definition, and is only exemplary in nature, a with reference to exemplary compounds, and cannot be considered to provide a definite scope could use of this term in the claims. With respect to **claim 20**, how can "an absorbent, hydrophobic polymer" be affected by a noble gas plasma to make it superabsorbent with respect to all possible liquids? Typically a material’s absorbance can be increased or decreased with respect to certain

types of liquids, such as polar or nonpolar liquids, but not all liquids as is effectively claimed. It is noted that **claim 21** which depends from 20, might be considered to further described the modified material, except that "a **super-absorbent** polymer capable of retaining **large** quantities of amine containing aqueous solutions" (emphasis added) formed therein is not the same "superabsorbent" recited in the preceding claim. Also note that "large" describing "large quantities" is a further related relative term lacking clear metes and bounds, since how much would constitute "large" is not defined. Claim 22 has an additional different problem, in that it is unclear **when** "the substrate is a superabsorbent material", since as claimed this could be before, during, or after any of the processing steps.

3. **Claims 2 & 13** are **objected** to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

For claim 1 as amended, it appears that **claim 2** does not provide any further limitation, since in line 6 of claim 1 the "/or" has been deleted, such that both steps (i) & (ii) are required, with the latter being performed on "the crosslinked material" and thus the antecedents now requires the steps to be performed in sequence, hence the examiner finds no way in which **claim 2** can be considered to further limit claim 1.

With respect to **claim 13**, as noted above in section 2, the examiner is unclear as to how claim 13 is supposed to further limit claim 1.

4. The **disclosure** is **objected** to because of the following informalities: in further reviewing the specification is noted that at least some recited chemical formulas do not have proper subscripting, such as in [0096] of the substitutes specification..

Appropriate correction is required.

5. **Claim 14-21** are rejected under 35 U.S.C. **112, first** paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

These claims require the substrate to be "a porous article", however as discussed above in section 3, particularly with regard to the limitation concerning void volume in claim 16, it is unclear what as defined by the specification actually constitutes a porous substrate, i.e. how dense a substrate may be how much <0.01 % void volume a substrate may have and still be called porous; or conversely what constitutes a nonporous substrate given the taught, but nonexclusive range of porous substrates.

For examples of void volumes that are generally considered porous or microporous, see **Mikos et al**. ((6,689,608 B1): abstract; col. 4, lines 46-65, porosity of polymer matrixs of 50-95% void volume); **Henn et al**. ((5,026,591): abstract; col. 19, lines 20-68, microporosity of polyethylene having exemplary void volumes 98 %, 91 % or 91 %); **DeFrank et al**. ((4,259,187): abstract; col. 4, lines 30-44, microporous polyethylene filters having exemplary 63 % & 45 % void volumes for 20 & 35 μ mean pore sizes respectively); & **Dornbusch et al**. ((4,475,837): abstract col. 6, lines 25-34 absorptive microporous polymers having void volume ranges from about 50-95 % for medium cell size from about 10-100 μ & media pore size of about 1-30 μ). The examiner found no evidence that a reasonable practitioner would consider void volumes of 0.01 % to be porous, thus it is impossible to term in what values lower than this should also be considered porous in light of applicants' specification, but which is required given applicants' claim construction.

6. The following is a quotation of the appropriate paragraphs of **35 U.S.C. 102** that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of **35 U.S.C. 103(a**) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The **nonstatutory double patenting** rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. **Claims 1-2, 7, 13-19 & 23** are **provisionally** rejected on the ground of **nonstatutory obviousness-type double patenting** as being unpatentable over claims 1-21 & 26 of copending Application No. **10/509,295**. Although the conflicting claims are not identical, they are not patentably distinct from each other because these two sets of application claims, in their multiplicity of possible combinations of steps, are directed to overlapping sequences of steps, and as such may be considered to encompass obvious variations of each other. Specifically, copending (295) includes the options of depositing polymer coatings by any of 7 methods, including plasma depositing their claimed applied polymer coating, where combinations of any of the methods can be employed, hence encompasses multiple coatings (e.g. any of the liquid deposition techniques + plasma deposition would be to depositions). The copending claims appear to encompass that coating may be applied with fluorinated species or the coating may be subsequently fluorinated. There are also options of "fluorination and/or curing, as well as claims explicitly requiring both to occur (19), where the various possible techniques of curing (claim 16: heating, the UV radiation, UV, EB &/or ionizing radiation) are noted by the examiner to encompass features of a plasma, and where they claimed alternative step options include depositing a polymer coating (may be considered part of a composite substrate), curing the coating, then fluorinating. The also option of disposing the coated substrate in the plasma after coating is a possibility (i.e. plasma curing), as is the curing of the fluorinated surface affecting the crosslinking of the underlying substrate, thus overlapping with possible options of the present claims, hence lacking clear distinction therefrom. Thus these claims continue to have options which read on the present claims.

It is further noted that as the present claimed porous substrates explicitly include void volumes as low as 0.01 %, with even lower void volumes necessarily encompassed by the broadest claim 14 that does not limit the void volume (i.e. in which case the claimed "pores" extending from the surface must be truly microscopic & may read on expected interstitial spaces between molecules), it is considered that any substrate that has not been rigorously densified to be close to theoretical density will read on applicants'

"porous article", if it contains any polymeric material, which copending (295)'s substrate + initial polymer coating (before curing & fluorinating) does. While the copending claims do not particularly specify "polyolefin, they do particularly specify unsaturated polymers of which polyolefins constitute a common, conventional and major class thereof, such that the use of polyolefins in the (295)'s process would have been obvious & reasonably expected by one ordinary skill in the art. With respect to the present claims 17-19, which discuss control with respect to limiting depth of process affects or localized areas, the copending claims include options of employing masking, which will inherently localize treatment areas, and any control of parameters employed in curing & fluorinating procedures will inherently have effects on the depth affected, and it is standard & conventional for one of ordinary skill in the art to determine & control process parameters to optimize affects desired, thus such optimization would have been reasonably expected.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

8. **Claim 23** is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1+12-13 & 20-26 out of U.S. Patent No. **6,551,950 B1** (Badyal et al.). Although the conflicting claims are not identical, they are not patentably distinct from each other because with respect to the product-by-process claim, whether any initial crosslinking occurs within the substrate is irrelevant since the structure of the substrate is completely undefined (may or may not be capable of crosslinking), however if capable of crosslinking or polymeric already, that any polymerization or crosslinking occurred does not produce a distinguishable substrate, as the substrate may contain any amount of crosslinking regardless of when that occurred and read on the claimed structure, which is minimal. In fact the claimed structure need not even have a coating, and may simply be any substrate, particularly any polymer containing substrate, as a polymer containing substrate has linkages between monomeric or oligomeric units. In the (950) patent, the claimed class of substrates as fabric or clothing,

would reasonably encompass polymeric fabric substrates whether natural or synthetic, however the plasma polymerized coating thereon is clearly a polymer that may be considered to encompass crosslinked structures, hence as applicants claims ambiguously encompass composite substrate materials, whether or not the plasma deposition option in the process is employed, the resultant structure may be considered to read on the product claim. Furthermore, it is noted that on col. 1, lines 22-35 in the background of (950) the patent indicates that for coatings on fabrics as claimed to be durable they must be cross-linked, i.e. bonded, to the fabric substrate, thus read in light of the specification, it would've been obvious to one of ordinary skill in the art for the claimed plasma polymerized coatings to have a structure that is bonded via crosslinking to the substrate, as the disclosure recognizes this is a necessity for durability & one of ordinary skill in the art when making taught water repellent coated fabric substrates would have reasonably have been expected to have optimized their coating procedure for durability.

9. **Claims 1-3 & 7-19** are rejected on the ground of nonstatutory **obviousness-type double patenting** as being unpatentable over claims 1-19 & 24 of U.S. Patent No. **6,551,950 B1** (Badyal et al.), in view of **Seki et al.** (JP 03-14677).

The Badyal et al. (950) patent's claims overlap with options of the current claims by plasma depositing a polymer layer to form oil &/or water repellent coatings on a substrate inclusive of polymeric materials, fabric, etc., which polymer layer may be formed from a fluoride containing gas &/or an unsaturated monomer having a sulphoanamide group (i.e. the gaseous monomer may be nitrogenous), using a pulsed plasma techniques, which may employ a high-frequency voltage, thus encompasses either RF frequency or microwaves, and being pulsed can be considered non-equilibrium as it is in a constant state of change or fluctuation. Average power density is employed claim use of <10 W or <1 W in a 470 cm^3 volume (implies chamber space). The patent claims differ from the current claims in that they do not require at least two plasma treatment steps (unless one considers each plasma pulse to be a plasma deposition of crosslinked material step), plus do not specifically mention the crosslinking occurring in the

substrate material, however as discussed above in section 8, read in light of the specification such crosslinking would have been expected to occur &/or would have been obvious to optimize in order to produce known desirable durable coating structures on claimed polymer &/or fabric substrates, and specifically does not require a sequence of treatment steps which employs both a step (i) that may or may not be plasma & specifies crosslinking & a step (ii) that requires some sort of plasma treatment, however as was seen previously in **Seki et al**. as discussed in the English abstract, disclose a sequence of plasma steps treating a fibrous substrate material with a low temperature gas plasma, where the gas may be fluorine containing C_2F_4 or C_2F_6 (i.e. a fluoride), or ethylene or a silane gas, in order to deposit a polymer film on the fibrous material. Thereafter, the polymer film is treated with a non-polymerizable gas (e.g. Ar, He, etc.) to crosslink the plasma deposited film.

The plasma polymerized deposition of unsaturated monomers, optionally fluorinated, to create oil &/or water repellent coatings, such as fluorinated polymeric layers onto polymeric fiber substrates (i.e. fabrics as is claimed by in (950), are analogous to plasma polymerized polymer films deposited on fiber of Seki et al., thus providing the reasonable expectation that the Badyal et al. (950)'s claims pulsed plasma deposited polymer coating may be advantageously further plasma treated using gases, such as Ar or He, to enhance crosslinking of the polymer deposit in order to enhance bleed resistant of the dyed fiber/fabric material, which would be consistent with the desire of the (950) patented claims to form water repellent coatings surface & possible coating of fabrics, hence such further treatment of the pulsed plasma deposited halogenated/fluorinated polymer layers would've been obvious to one of ordinary skill in the art in order to insure adequate adhesion/crosslinking/bleed resistance or the like of such coating materials on fibrous polymer substrates, where routine optimization for particular polymeric materials & plasma conditions would have been expected to optimize such process.

Also note that the fabric substrates of either of these references would be considered poor substrates, without even considering applicants extraordinarily broad range of what they call "porous".

10. **Claims 1-3, 7-19 & 23** are rejected under 35 U.S.C. **103(a)** as being obvious over **Badyal et al.** (**6,551,950 B1** ≡ **WO 98/58117**), in view of **Seki et al.** (JP), or vice versa.

With respect to the applied reference **6,551,950 B1** has a common inventor (Jas Badyal) with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

See discussions above in **sections 8-9**. Also note that the equivalent PCT reference has equivalent teachings to Badyal et al. (950), and that in the body of the specification of Badyal et al. (950) , see (or ≡ paragraphs in (WO)) the abstract; figures 1-4; col. 1, lines 1-60, especially 22-35; col. 2, line 65-col. 3, line 10 (non-equilibrium plasma) & lines 11-67 for suitable monomeric organic compounds to be employed in the plasma; col. 4, lines 6-18, which discusses substrates such as particular fabrics possibly previously treated, thus consistent with dyed; col. 4, lines 19-61 for plasma deposition parameters and techniques, per strictly specifying routine determination of parameters depending on substrates and nature of polymer been deposited (lines 20-24) & the pulsed plasma polymerization technique providing well adhered coatings with greater levels of structural retention (lines 49-56), which the examiner considers to suggest the taught no need for durable bonds with the substrate, i.e.

crosslinking with a polymer substrate; col. 4, lines 65-col. 5, line 3 specifically suggesting the previously described pulsed plasma polymerization techniques to cause will adhere at coatings be applied to fabric substrates; col. 6, lines 1-19 demonstrating that the plasma polymerization process is not just causing absorption of monomers on the substrate, which the examiner considers to suggest bonding to the substrate, which for taught polymer substrates would reasonably have been considered cross-linking to the substrate. It is further noted that Exs. 2 & 4 are directed to cotton fabric substrates (i.e. cellulosic or natural polymer substrates) where col. 8, lines 65-68 note the coatings have good durability (e.g. suggesting cross-link thereto); and where Ex. 5 (col. 9, lines 1-35) is to a silicone coated acrylic/nylon fabric, which is pulsed plasma treated with a fluorinated acrylate monomer & the fabric subjected to durability tests & comparison to a like piece of fabric with the monomer is grafted thereto (air plasma followed by vapor deposition, noting that grafting is a crosslinking connection with the substrate), where the polymerized plasma fabric shows enhanced water repellency & durability in comparison to the graph polymerized sample.

For reasons as discussed above, it would've been obvious too one of ordinary skill in the art to perform the Seki et al. non-polymer gas plasma post-treatment on the plasma polymerized initial coating in order to perform further crosslinking to improve sealing characteristics (e.g. bleed resistance, etc.) of the initially applied plasma polymer.

<u>Alternatively</u>, while Seki et al. does not indicate that crosslinking to the polyester fiber substrate occurred during the initial plasma polymerization deposition process, Badyal et al. ((950) or (WO) on col. 1 or the paragraph bridging pages 1-2 , respectively) in their background indicates that durable polymeric coatings on fibers require bonding (e.g. crosslinking) to the fiber substrate, hence as Seki et al. is interested in the durability of their dye treated fiber (e.g. bleed resistance), it would've been obvious to one of ordinary skill in the art to optimize Seki et al. is generic low-temperature plasma to employ plasma parameters, such as useful ones suggested by Seki et al. for pulsed plasma polymerization techniques as a

starting point for suggested routine experimentation, to provide optimization of the initial plasma polymerization step to ensure crosslinking with the polyester fiber substrate, in order to ensure suitable durability to the resultant product.

11. **Claims 1-3, 7-16 & 22-23** are rejected under 35 U.S.C. **102(b)** as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **Badyal et al.** (6,358,569 B1).

Claims 4-6 or optionally **1-19 & 22** are rejected under 35 U.S.C. **103(a)** as being unpatentable over **Badyal et al.** (6,358,569 B1), alone or in view of **Badyal et al.** (**6,551,950 B1 ≡ WO 98/58117**),

In **Badyal et al.** (569), particularly see the abstract; figure 5; **col. 1**, lines 3-68+, especially lines 28-30 relating to treatment of a porous or microporous substrate, lines 30-36 employing pulsed electrical & pulsed gas to form an **adherent layer** of unsaturated carboxylic acid polymer on the substrate, then attaching perfluoro alkyl groups to the polymer surface, lines 37-44 where the pulsed gas in the plasma may be an acrylic acid polymer precursor by itself, or may be used with a pulsed process gas that may be oxygen, or he noble or inert gas or N_2, etc., lines 55-56 where the plasma power is preferably 1-100 W or 1.5-7 W, lines 57-61 teaching substrate material may be carbonaceous (e.g. natural materials such as cellulose...), synthetic, ceramic or metallic or combinations thereof; col. 2, lines 33-58 teaching superior surface coverage with pulsed gas alone or in combination with RF pulses, with application to filtration, chromatography & medical devices, mentioning low-cost thermoplastic substrates coated, porous or microporous substrates, or polymers such as polyethylene (line 44) i.e. a polyolefin) & cellulose of polyurethane foam substrates have been absorbent natures coated by the taught process sequence, to form a final product with a superhydrophobic surface layer (line 50-54); col. 3-4, esp. Parameter descriptions for figures & lines 34-45 & 60-col. 4, lines 7 & 47-67 teach various sets of plasma parameters & operational conditions, with col. 4, lines 47-67 discussing the desirable use of oxygen gas for improved retention of monomer structure (i.e. oxygen retention, thus creating hydrophilicity at this stage of the

process); col. 5, esp. lines 1-12 & 36-41 discussing an exemplary first treatment employing pulsed gas & electric poles for plasma polymerization in the presence of oxygen, thus increasing the oxygen content on the substrate surface as well as depositing the initial layer & teaching to optimize the subsequent surface F derivatisation; and **col. 6**, lines 11-17 for the option of using <u>a further cold plasma step</u> to fluorinate (i.e. plasma modification) the deposited plasma polymerized polymer layer using SF_6; and claims, particularly 1-2, 9-10 & 12-13. Note these teachings are considered to read on applicants claims' option of employing a combination of step (i) ≡ the adherent plasma polymerization deposition is on a taught polymeric substrate, which would create crosslinking between substrate & plasma deposit layer & step (ii) ≡ techniques of plasma fluorinating of a crosslinked material, that may employ a pulsed RF plasma (i.e. non-equilibrium) & pulsed gas (i.e. plasma modification thereof using a fluoride containing gas).

While **Badyal et al**. (569) do not explicitly discuss crosslinking of their plasma polymerized acrylic acid polymer with taught polymeric substrates, employing the taught pulsed plasma with a polymeric substrate would inherently create active sites on the substrate to which the plasma is applied, such that the polymer monomers plasma polymerized onto the substrate during the taught plasma process would inherently form at least some crosslink bonds to the surface when forming the taught adherent layer, thus reading on the claimed step (i) treatment required to cause crosslinking of substrate material, inclusive of on the surface (e.g. the exterior). <u>Alternatively</u>, as Badyal et al. (569) teach that the plasma polymerized layer should be adherent & teach usages such as in filtration, chromatographic & medical devices where separation of the deposit layer would be detrimental, it would've further been obvious to one of ordinary skill in the art to optimize their plasma polymerization process in order to maximize bonds between the plasma polymerized layer & taught polymer substrates in order to produce taught adherence &/or strengthen or increase the degree of adherence to ensure reliable operation. <u>Optionally</u>, it would've been further obvious in view of teachings of **Badyal et al**. ((950) or (WO 117)) in their background concerning the importance of bonding between analogous coating & substrate material.

It is noted that while applicants' claims are frequently unclear as to when the various dependent claim limitations are actually being performed, the teachings of Badyal et al. (569) may use both pulsed plasma & pulsed gas on neither their first or second plasma process, thus may be considered to read on any of these dependent claim processing parameters. Alternatively, the majority of specifically discussed process parameters in (569) are directed towards the initial plasma polymerization deposition process, where the specific example of plasma fluoridation does not provide specific power parameters, however it would've been obvious to one of ordinary skill in the art to employ routine experimentation to determine optimal parameters for achieving the taught fluorination effect, where parameters as taught for the initial plasma polymerization reaction would have been a reasonable starting point for routine experimentation to optimize for the next stage of plasma treatment, given that the previously applied surface coating may be considered to be a feature in common.

While claims 4-6 have considerable confusion in their possible meanings, it is possible that they could be applicable to treatments of either step (i) or (ii), where it's noted that designations in these claims of first & second step could be considered applicable to effects in sequential pulses in the process of Badyal et al. (569), since these steps are somehow differentiated from those of the independent claim & since the use of oxygen admixed in the pulsed gas & pulsed plasma deposition process increases oxygen functionality retention, hence may be considered to be acting to oxidize in order to provide such retention, noting that the acrylic acid polymer deposited would be a hydrophilic layer. However this process is differentiated from applicants in that while Badyal et al. (569) teaches use of oxygen or noble or inert gas or nitrogen with their acrylic acid polymer precursor, they do not specify mixing these process gases, however it would've been obvious to one of ordinary skill in the art to employ mixtures that include nitrogen or inert or noble gases, as such is a standard plasma processing practice, typically employed for optimizing pressures or proportions of individual components within a desired pressure range, especially

considering that these gases are typically desirable gases for plasma stability & may generally be employed without undesirably affecting the composition of the applied coating.

The examiner notes that oxygen gas used in the plasma will inherently produce various oxygen species, inclusive of ozone, thus is considered to be inclusive of oxidation methods that may be called ozonolysis.

With respect to the wide range of claimed void volumes of 0.01-99 %, it is considered that the taught porous or microporous substrates, while not been described with a particular void volume, would necessarily be encompassed by this extraordinarily broad range, and necessarily in comp is the existence of pores in the void volume structure. Alternatively, it would've been extraordinarily obvious to one of ordinary skill in the art would employing taught porous & microporous substrates in the taught process, to employ claimed void volumes, as it would be virtually impossible not to.

12. **Claims 1-3, 8, 13-19 & 23** are rejected under 35 U.S.C. **102(b)** as being clearly anticipated by **Schultz Yamasaki et al.** (6,156,394).

As applicants' claims have no context for "improving the absorbency", with it noted that no claims have ever been directed to fabric (contrary to applicant's arguments on page 10 of the 4/15/09 response), and that an improvement in absorbency can include causing a substrate to be less absorbent, especially considering what is or is not being absorbed is in no way specified, the amendments to the claims can in no way be said to remove the teachings of Schultz Yamasaki et al. for reading on the claims as still written. Note that whether a teaching causes cross-linking to occur to somehow change an absorbent property, or for some other purpose (e.g. increasing adhesion) is entirely irrelevant to the claims as written, since the claimed process need only cause crosslinking to occur at some location with respect to the substrate material, where that cross-linking itself need have no effect on "the absorbency", even if its context was defined & the final results was positively ascribed to the body of the claim steps, because it is the required results, & has not been attributed to any particular step in the overall process.

Furthermore, improving adhesion can be considered to increase the absorbency of the coating material on the substrate, which is within the broad possible meanings of the amended claim language. As the process of Schultz Yamazaki et al. change the characteristics of the substrate surface, the absorbency thereof will have been changed, and since there change to surface is desired, it may be considered "improved". Especially note that col. 6, lines 35-58 discuss altering the carbon/oxygen ratio on the surface (i.e. limited), which will inherently effect the hydrophobicity/hydrophilicity of the surface, thus the probability of polar or nonpolar liquids being absorbed on the surface, further showing the deficiency of applicant's arguments with respect to present claim limitations. If applicants have a *particular* meaning in mind, they must provide sufficient context in the claims in order to provide that meaning.

To reiterate, **Schultz Yamasaki et al**. teach improving the adhesion of optical coatings (e.g. plasma CVD deposited silicon nitride, etc.) on polymeric optical substrates via the exposure to electromagnetic radiation having wavelengths of about 30-350 nm, which may be performed via direct exposure to gas plasmas of He, Ar or nitrogen, and causes cross-linked bonds to form in the polymeric substrate surface, so that there is consequently improve the adhesion at the interface with the subsequently deposited coating that may be plasma deposited. The exemplary direct exposure plasma apparatus employs a microwave/RF dual frequency plasma system, where a negative DC substrate-bias voltage may be applied to cause ion bombardment from the plasma, where it's noted that this extraction of ions to bombard the surface may be considered a form of non-equilibrium plasma. Also, Schultz Yamasaki et al. teach that other useful direct exposure plasma apparatus may include simpler or more complex systems. Particularly see the abstract; figures 4 & 6-7; col. 1, lines 5-25; col. 2, lines 1-20+; col. 3, lines 10-26; col. 4, lines 1-20+ (substrates, inclusive of polyolefins) & 40-60; col. 5, lines 37-52; col. 6, lines 13-35 (plasma/electromagnetic wave pretreatment resulting in changes in stoichiometry, increased resistance to acetone damage & cross-linked bonds on surface); col. 7, lines 15-44; col. 8, lines 11-21 & 35-50; examples, especially noting the PECVD of silicon nitride (col. 9, lines 28-39 employed in those the

examples & Ex. 2, col. 10, lines 20-54; Ex. 3, col. 12, lines 20-32; Ex. 5, col. 14, lines 65-col. 15, lines 14; Ex. 6, col. 16, lines 15-32); and claims 1-5, 11-13 & 17-24.

Note that plasma power employed by Schultz Yamasaki et al. varies dependent on particular plasma process & gas, such as in col. 16, lines 1-32 microwave plasma employing ammonia or N_2O using 150 W, or a biased RF pretreatment gas plasma of ammonia using 30 W, or an argon RF plasma employing 30 W or Ar in remote or direct microwave plasma of 150 W, with subsequent deposition of amorphous silicon nitride, which for plasma CVD thereof, as suggested in the reference via a silane ammonia mixture, would be deposition of a nitrogenate material with a nitrogen containing compound.

13. **Claims 1-2 & 7-10** are rejected under 35 U.S.C. **102(b)** as being clearly anticipated by **Nguyen et al** (5,244,730).

Nguyen et al teach a process of plasma polarization of a fluorocarbon layer where a plasma polymerized fluorocarbon layer is deposited on the internal surfaces of the plasma chamber, exemplified by a 2-stage plasma process using carbon fluoride gases, then followed by use of the plasma chamber for plasma polymerization deposition on substrates which causes further deposition of the plasma polymerized material on the interior surface of the chamber as well as on the substrates being processed, where the deposition process is taught to form highly cross-linked fluorocarbon films. Is further taught after sufficiently long periods of use (e.g. 10 hours) when deposited thicknesses of a fluorocarbon materials have built-up on the chamber, it is clean by oxygen plasma, that the plasma deposition coating process for internal surfaces & use is repeated. Particularly see the abstract; the figure; col. 3, lines 27-col. 4, lines 50+; col. 5, lines 57-67; col. 6, lines 7-25; an example 1 on col. 6. These teachings read on the first plasma polymerization stepped depositing a plasma polymerized layer which may be considered part of the substrate material for subsequent steps, with the next plasma polymerization deposition causing crosslinking therewith (i.e. step (i)), plus subsequent plasma polymerizations or oxygen plasma cleaning is being an unspecified number of step (ii) plasma modifications or plasma deposition of crosslinked

material onto either in the plasma cleaned chamber surface or onto cross-linked plasma deposited material. As has been previously noted, the plasma depositions onto the plasma deposited fluorocarbon, would inherently be causing further crosslinking of the previously deposited polymeric material, thus it's also effectively inclusive of step (i) preformed both concurrently & in sequence with step (ii).

Note plasma treatment/deposition may be via RF plasmas, where power includes 100-1000 W (col. 4, lines 1-64), thus overlapping with claimed power ranges.

14. **Claims 1-3, 8-10 & 13** are rejected under 35 U.S.C. **102(b)** as anticipated by <u>or</u>, in the <u>alternative</u>, under 35 U.S.C. 103(a) as obvious over **Kamel et al**. (5,326,584).

Claims 1-3 & 8-10 & 13-19 are rejected under 35 U.S.C. 103(a) as being obvious over **Kamel et al**. (5,326,584), in view of **Schultz Yamasaki et al.** (6,156,394).

The claims have been amended to necessitate the step (i) crosslinking limitation, thus the previously argued inherency/obviousness with respect to that sequence as previously in claim 2, at now applies to claims 1-3 & 13.

Kamel et al. (abstract; col. 6, lines 4-41; col. 7, lines 42-68; col. 8, lines 12-col. 9, lines 30+; examples, e.g. Ex. I + Ex. II; and claims 1-9) teach a process of modifying the surface of polymeric substrates, such as polymeric intraocular lenses of material such as PMMA, via a sequence of plasma steps, that include initially cleaning the polymer surface via a plasma etching with RF plasma of gases that may be nitrogen or ammonia (if introduction of nitrogen is compounds is desired), or noble gases such as argon (for creation of active sites that do not produce new chemical groups). After cleaning/activation polymeric substrate, a polymeric biocompatible material may be applied via further radio frequency plasma treatment, i.e. a plasma polymerized deposit. Note that taught RF plasma powers include about 100-200 W or 50-200 W (claim 16 or col. 6, lines 60-65).

Kamel et al. while employing an initial nitrogen or Ar gas plasma to polymeric substrates, such as PMMA, in teaching a pretreatment activation of the surface that improves adhesion of subsequent

coatings, do not discuss these plasma treatments as producing further crosslinking of the surfaces, however the energetic environment created by these in situ plasmas would have inherently produced crosslinking in surfaces such as the exemplified PMMA or alternatively taught activation to create active sites would have been reasonably expected to have been provided by optimization inclusive of such bonding rearrangements. Alternatively, Schultz Yamasaki et al., discussed above demonstrated that direct plasmas, inclusive of nitrogen plasmas & Ar plasmas, as well as He plasmas, when used to treat PMMA substrates cause crosslinking thereof, which provides improved adhesion for subsequent plasma deposited coatings, thus it would've been obvious to one of ordinary skill in the art to optimization of the plasma pretreatments of Kamel et al. (including use of suggested plasma apparatus structures/techniques) to effect such crosslinking of polymeric optical lens surfaces, as treated by both references, in order to provide the advantages of improved at adhesion of subsequent plasma deposited coatings desired by both references, with the advantage of good optical quality also desired in both references.

15. **Claims 1-8, 13-14 & 17-23** are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **Peyman et al**. (4,312,575).

Claims 9-10 & 15-16 are rejected under 35 U.S.C. 103(a) as being obvious over **Peyman et al**. (4,312,575).

Peyman et al. (abstract; figures; col. 1, lines 7-15; summary, esp. col. 4, lines 28-47 & col. 5, lines 3-11; col. 5, lines 41-col. 6, lines 57+; col. 7, lines 20-32 & 43-66 & Exs. I & II) teach a coating process for soft corneal contact lenses, which are oxygen permeable & can be formed of silicone polymers, copolymers of silicon, polyurethane or other oxygen permeable polymeric material suitable for contact lenses, with specific mention of use of copolymers or inter polymers preferred. The core of the polymeric lens is hydrophobic & is coated to make it hydrophilic, such that it is highly oxygen permeable & has a long-lasting wettability via a process using glow discharge plasma polymerization of at least one compound inclusive of hydrocarbons &/or halogenated hydrocarbons (including fluorine), where the

plasma polymerization is performed to create a highly cross-linked coating, with the examiner noting for it to be highly cross-linked when deposited on the polymeric core, the crossed linking must inherently encompass at least some crosslinking to the polymeric core surface. A further glow discharge treatment may be performed in an atmosphere of oxygen or oxygen + Ar to provide a highly hydrophilic surface to the resulting lens. Exemplary deposition processes include a 2 step plasma polymerization deposition where the two main sides of the lens are coated first, then a subsequent deposition process may be performed on the edges of the contact lens core (Ex. I), which may be considered to consist of cross-linked material, with it noted that for the claims as written, where coating of the second deposition resides in the structure is not necessarily on to the actual crosslinking, as long as it is on to substrate material, where some material of the substrate has been cross-linked by a previous step. Also note that plasmas will inherently cause some degree of heating.

The glow discharge processes employed by Peyman et al.'s examples used 10 kHz power source to create the glow discharge, thus reads on an RF plasma, and while no particular values for power usage, i.e. Watts, were taught, it is specifically taught that the wattage used will depend on such factors as surface area of the electrode, and flow rate and pressure of the monomer utilized (col. 7, lines 59-64), hence it would've been obvious to one of ordinary skill in the art to consider such conditions & employ routine experimentation when performing their various plasma processes, such that it would have been reasonably expected by one of ordinary skill in the art to employ powers within ranges claimed, as analogous processing for analogous results are being performed. It is further noted that since the plasma polymerization & postdeposition treatments taught will use specific parameters to achieve specific results, as well as teachings concerning locations treated, the gaps with respect to the surface are inherently limited by parameters employed.

With respect to "superabsorbent", as this term has no clear defined range or specific meaning, it is considered that the created surface having a highly hydrophobic nature which provides long-lasting

wettability, may be considered to read on this in definite term. With respect to the capability of "retaining large quantities of a being containing aqueous solutions", bodily fluids to which contact lenses are exposed can contain amines (although they need not ever be so exposed) & since the lenses are hydrophilic & wettable, they may retain aqueous solutions, including such solutions which also contain amines, although whether or not they ever actually do so is not relevant to the present claims.

Note with respect to the glow discharge oxygen treatment, it is noted that such an oxidation method will inherently form among the species of the oxygen containing plasma some ozone, thus may be considered to read on the claimed ozonolysis.

With respect to the claim of a bulk matrix being polyolefin, while Peyman et al. do not specifically teach the copolymers to be employed with the silicone polymer materials, they do not limit what polymeric materials may be employed as copolymers, hence it would've been obvious to one of ordinary skill in the art to use polymeric material known to be desirable in lenses for various known properties desirable therefore, such as those listed in the background in columns 1-3, which encompass polymeric materials employing olefinic components, thus it would've been obvious to one of ordinary skill in the art to use such olefinic components as the generic copolymeric material suggested to be useful in the core substrates. As a substrate material is taught to be oxygen permeable, it is considered to be porous in the scope as defined by applicants' enormously broad & uncertain scope range of void volumes that describe porous for purposes of the present specification, and while no particular void volumes are specified by the specification, it would've been obvious to one of ordinary skill in the art that the lower and of the claimed range of void volumes would have reasonably been expected to overlap with such highly oxygen permeable polymeric lenses, in order for them to fulfill their taught capabilities.

16. **Claims 1-3, 8, 13-16 & 17-23** are rejected under 35 U.S.C. **102(b)** as anticipated by **Sano et al**. (4,265, 959).

Claims 9-10 & 16 are rejected under 35 U.S.C. 103(a) as being obvious over **Sano et al**. (4,265,959).

Sano et al. (abstract; col. 2, lines 1-39 col. 3, lines 7-50; examples) teach a porous membrane, on which various operation may be initially performed, inclusive of performing gelation (i.e. crosslinking) due to temperature (i.e. heat) to a cast substrate, where that porous membrane may be subsequently plasma treated the glow discharge employing gases, such as hydrogen, He, Ar, nitrogen, oxygen,... ammonia, water. The porous membrane material is taught at the end acrylonitrile polymer which may contain polyolefinic components, and where it is taught porosity, while not specifically disclosed, is considered that it must in order to be called porous be somewhere within the broad claimed range, alternatively it would've been obvious to one of ordinary skill in the art to employ a void volume in forming the taught porous membrane within typical ranges of what is considered porous, which would have been reasonably expected by one of ordinary skill in the art to be totally in compass by applicants range. Note that the exemplary plasma processes disclose a discharge voltage & a discharge current, implying use of DC plasma. While specific plasma powers are not employed it would've been obvious to one of ordinary skill the art to employ routine experimentation, depended on particular plasma apparatus & plasma gasses & relevant plasma parameters with respect thereto, reasonably expected to be inclusive of claimed powers, with it additionally noted that particular power employed is not particularly relevant, as is the power density that makes a difference according to what is employed, since the same power may be applied to different volumes & areas to get extremely different effects.

17. Applicant's arguments filed 4/15/2009 & discussed above have been fully considered but they are not persuasive.

Applicants have based the majority of their arguments on the contention that the claims require crosslinking the substrate before any deposition occurs, however this is incorrect, since as written the claims are inclusive of the first treatment involving crosslinking of a coating material to the substrate

material (i.e. the external surface), which will occur in any polymeric grafting to a polymer substrate, and in processes where polymer deposition is said to be bonded to a polymeric substrate, such as plasma polymerization on a polymer substrate, hence applicants' arguments are not convincing.

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

19. **Any inquiry** concerning this communication or earlier communications from the examiner should be directed to **Marianne L. Padgett** whose telephone number is **(571) 272-1425**. The examiner can normally be reached on M-F from about 9:00 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks, can be reached at (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-

direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Marianne L. Padgett/
Primary Examiner, Art Unit 1792

MLP/dictation software

8/(13-14 & 16-17) /2009